Trend Study 9-12-00

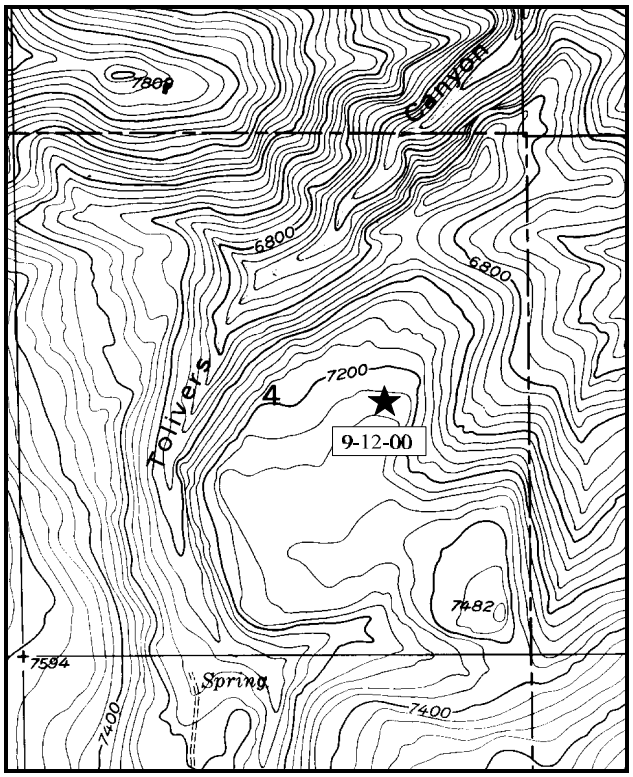
Study site name: Browns Park Burn & P-J . Range type: Pinyon-Juniper .

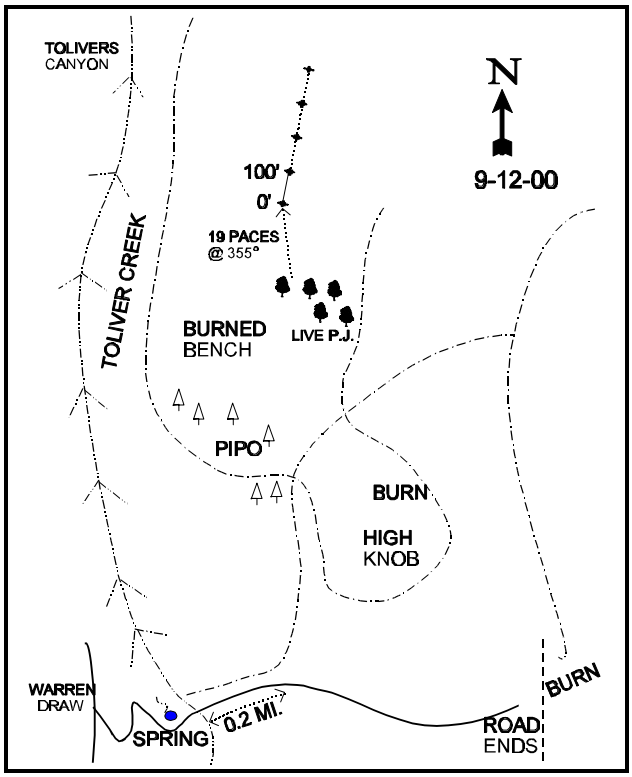
Compass bearing: frequency baseline 358°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

From the Warren Draw trend study, #9-7-00, proceed north 3.2 miles to a locked gate onto private land. Talk to the biologist for the key. Continue 1.9 miles to a fork by a stockpond, stay left. Go 0.45 miles to a fork, stay right. Continue another 0.45 miles, again bear right. Continue 0.4 miles down to the creek bottom. Proceed up the road for 0.2 miles, to a low point beneath the bench to the north. It is probably easiest to hike up to the bench from the low pass. Hike north, about ½ mile, over the top and down the burned bench. From the level ponderosa pine bench, continue north down the increasing slope where you will find the short green fencepost marking the burned P-J portion of the study.





Map Name: Warren Draw Diagrammatic Sketch

Township 1N , Range 24E ,Section 4 UTM 4523534.738 N, 651162.408 E

DISCUSSION

Trend Study No. 9-12 (11-13)

The Brown's Park P-J and Burn study samples a prescribed burn treatment that was conducted by the BLM in the upper Toliver Creek drainage in 1986. The treatment burned approximately 420 acres, containing several different range types; mixed mountain brush, Ponderosa pine, pinyon-juniper and curlleaf mountain mahogany. The trend study was established in the more prevalent pinyon-juniper/curlleaf mountain mahogany type. The study site is on a north facing slope of about 10-15% at an elevation of 7,200 feet. Abundant thermal and escape cover exists on areas surrounding the burn. Pellet group transect data taken along the baseline in 2000 show big game use to be light at the present time. Deer use is estimated at 5 days use/acre (12 ddu/ha) and elk use is estimated at 17 days use/acre (42 edu/ha). Livestock also graze the area with use being estimated at 12 cow days use/acre (30 cdu/ha) in 2000. According to BLM personnel, this area is grazed in conjunction with the Taylor Flat allotment, but the burned areas are only grazed 1 out of every 3 years.

The soil on this particular slope is moderately shallow with large rocks and boulders being prevalent on the surface. The soil itself is a coarse textured sandy loam with an estimated effective rooting depth of just over 10 inches. Nearly 80% of the penetrometer readings used to estimate a profile stoniness index hit rock within the upper 5 inches of the soil surface. The shallowness of penetrometer readings is the result of abundant bedrock being present over the site with a shallow layer of soil on top. Since the fire and the 1988 reading, there had been significant erosion due to the loss of duff and understory vegetation. Nearby unburned areas also showed serious erosion and soil loss due to the naturally sparse understory and runoff from surrounding bare areas. Initially, loss of the already shallow soil resulted in exposed plant roots and more rock. Erosion was not noted in 1995 due to the excellent protective ground cover from an improving understory. Rock cover has remained high at 27% in 1995 and 32% in 2000. Bare ground was estimated at 63% in 1988 declining to only 10% by 1995, and 12% in 2000. Litter cover increased from 7% to 47% by 1995, but slightly decreased to 42% in 2000. Vegetation cover has steadily increased with each reading as seeded grasses continue to increase on the site. Vegetation cover is currently ('00) estimated at 36%.

Unburned areas are dominated by an overstory of pinyon and juniper. Scattered curlleaf mountain mahogany, true mountain mahogany and snowberry occur in the understory. Tree species within the burn were completely killed by the fire, however many standing snags remain. Pre-burn pinyon density was estimated to be 467 trees/acre. The only browse encountered on the burn site in 1988 was sprouting mountain lover which numbered 333 plants/acre measuring only 4 x 3 inches. Currant and elderberry were also resprouting but were not encountered in the density plots. During the 1995 reading, several additional browse species were encountered including: serviceberry, manzanita, mountain big sagebrush, curlleaf mountain mahogany, true mountain mahogany, rubber rabbitbrush and snowberry. In 1995, all species were estimated at densities of 40 plants/acre or less, except for white-stemmed rubber rabbitbrush and snowberry which were estimated at 100 plants/acre and 80 plants/acre respectively. All species showed good vigor and light use in 1995. Browse continues to be low in abundance in 2000 with only rubber rabbitbrush, mountain lover and mahogany slightly increasing in density. Currently ('00), use remains light and vigor is good on all browse species.

Herbaceous vegetation was scarce in 1988 with few grasses and forbs appearing in the quadrats. No vegetation was hit with the points of the quadrats so there was no vegetation data estimated in 1988. Only annuals, mainly coyote tobacco (*Nicotiana attenuata*), were present. During the 1995 reading, 8 species of perennial grass and one sedge were encountered which combined to produce 16% cover. The site supports several native grasses including muttongrass, bluebunch wheatgrass, squirreltail, fescue, and a sedge. Seeded species including crested and intermediate wheatgrass, smooth brome, and orchard grass were also sampled. Crested wheatgrass is the dominate grass producing nearly 12% cover in 1995, increasing to 18% in 2000. Smooth brome is the second most numerous perennial grass which significantly increased in nested frequency in 2000. Quadrat frequency of

smooth brome also increased from 38 in 1995 to 71 in 2000, while cover increased from 2% to 9%. Both of these species have good vigor and provide good ground cover on this shallow soiled site. Cheatgrass was sampled in 1995 and was fairly abundant, contributing to over 3% cover and having a quadrat frequency of 49%. In 2000, cheatgrass was not sampled at all due to the extremely dry conditions. Forbs are infrequent especially in 2000 with drought. In 1995, ten species of perennial and 8 species of annual forbs were sampled. The number forbs sampled in 2000 decreased to 6 perennial and 3 annual species, with all species combining to provide just over 1% average cover. Sum of nested frequency for perennial grasses increased in 2000, while sum of nested frequency for perennial forbs slightly decreased from an already very low level.

1988 APPARENT TREND ASSESSMENT

With such a low density of living plants on the burn, no vegetative cover was sampled. The majority of the ground surface (63%) was bare soil. Rock and pavement cover was almost 30%. Litter was reduced by the fire, but it should recover to significant soil protection levels. Trend appears stable but in poor condition. Browse are lacking on the site but this should change over time. The herbaceous understory is sparse and needs time to become established.

1995 TREND ASSESSMENT

Ground cover characteristics have improved dramatically since 1988. Percent litter cover has increased from 7% to 47% while percent bare ground has declined from 63% to only 10%. Herbaceous vegetation has also increased significantly adding needed protective cover. Trend for soil is up. Browse are still lacking on the site but more species are coming in. Trend is up. The herbaceous understory has increased dramatically in sum of nested frequency. An additional 8 perennial species were encountered in 1995 with seeded crested wheatgrass and smooth brome being the most numerous. Sum of nested frequency of forbs also increased significantly. Trend for herbaceous understory is up.

TREND ASSESSMENT
soil - up (5)
browse - up but still not abundant (5)
herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is slightly up even though bare soil has increased from 10 to 12%. Vegetation cover increased significantly with the increase in crested wheatgrass and smooth brome. Cryptogamic cover also significantly increased from less than 1% in 1995 to over 8%. This provides additional important protective ground cover on this site which has shallow soils to begin with. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil increased from 3.2:1 to 5.5:1. Trend for browse is stable. Browse remains at low, but stable densities on the site. Use is light, and vigor is good on all species. Several years of normal or above normal precipitation is needed to provide favorable conditions for young shrubs to establish and be able to persist. Trend for the herbaceous understory is slightly up. The seeded grasses, crested wheatgrass and smooth brome, continue to increase in frequency. Both species have increased cover values which provide needed soil protection.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable (3)
herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 12

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron cristatum	a13	b269	b274	8	92	88	11.86	18.31
G	Agropyron intermedium	a-	b23	b32	-	8	12	.64	.28
G	Agropyron spicatum	-	3	-	-	1	-	.15	-
G	Bromus inermis	a-	b86	c207	-	38	71	2.09	9.42
G	Bromus tectorum (a)	-	b130	a-	-	49	-	3.29	-
G	Carex spp.	a-	b10	b6	-	4	3	.33	.09
G	Dactylis glomerata	a-	b10	b14	-	6	6	.49	.25
G	Festuca ovina	-	1	-	-	1	-	.03	-
G	Oryzopsis hymenoides	4	-	-	2	-	-	-	-
G	Poa fendleriana	a-	b17	b22	-	7	10	.11	.29
G	Sitanion hystrix	a-	b20	a4	-	8	2	.41	.03
Total for Annual Grasses		0	130	0	0	49	0	3.29	0
Total for Perennial Grasses		17	439	559	10	165	192	16.13	28.69
Total for Grasses		17	569	559	10	214	192	19.43	28.69
F	Agoseris glauca	-	-	1	-	-	1	-	.00
F	Allium spp.	a-	b18	a-	-	7	-	.04	-
F	Arabis spp.	a-	b14	c33	-	6	16	.03	.08
F	Balsamorhiza hookeri	-	3	-	-	2	-	.19	.00
F	Chenopodium album (a)	1	-	-	1	-	-	-	-
F	Collomia linearis (a)	-	4	-	-	2	-	.01	-
F	Collinsia parviflora (a)	-	12	-	-	8	-	.04	-
F	Crepis acuminata	a-	b7	a-	-	3	-	.21	-
F	Cymopterus longipes	a-	b11	b3	-	5	3	.05	.01
F	Descurainia pinnata (a)	a3	b105	a5	1	50	2	.30	.01
F	Erigeron spp.	a-	a5	b-	-	3	-	.05	-
F	Gayophytum ramosissimum (a)	-	b16	a-	-	8	-	.04	-
F	Heterotheca villosa	a-	a5	b17	-	2	6	.41	.89
F	Lappula occidentalis (a)	-	b6	a-	-	3	-	.01	-
F	Lactuca serriola	a-	b19	a-	-	8	-	.04	-
F	Melilotus officinalis	3	-	-	1	-	-	-	-
F	Microsteris gracilis (a)	-	b42	a3	-	16	1	.27	.00
F	Polygonum douglasii (a)	-	b9	a-	-	4	-	.02	-
F	Sisymbrium altissimum (a)	-	5	-	-	2	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Taraxacum officinale	-	6	3	-	2	2	.03	.01
F	Tragopogon dubius	$_{a}$-	$_{a}$2	$_{b}$12	-	2	7	.04	.08
Total for Annual Forbs		4	199	8	2	93	3	0.71	0.01
Total for Perennial Forbs		3	90	69	1	40	35	1.10	1.10
Total for Forbs		7	289	77	3	133	38	1.81	1.12

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 12

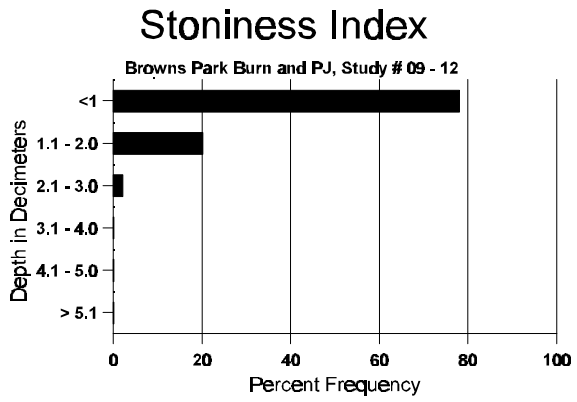
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Arctostaphylos uva-ursi	1	0	-	-
B	Cercocarpus ledifolius	2	2	.38	.88
B	Cercocarpus montanus	0	1	-	-
B	Chrysothamnus nauseosus hololeucus	5	6	.66	.66
B	Chrysothamnus viscidiflorus viscidiflorus	1	0	.00	-
B	Pachistima myrsinites	2	3	-	.03
B	Pinus edulis	0	2	-	-
B	Sambucus cerulea	1	1	.56	.03
B	Symphoricarpos oreophilus	3	2	.03	.53
Total for Browse		15	17	1.63	2.13

BASIC COVER --
Herd unit 09 , Study no: 12

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	331	349	0	23.90	36.50
Rock	310	297	28.00	27.12	32.09
Pavement	138	157	1.75	.41	2.28
Litter	390	362	7.00	46.50	41.93
Cryptogams	41	188	0	.36	8.36
Bare Ground	237	164	63.25	9.69	11.98

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 12, Study Name: Browns Park Burn and PJ

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.67	58.8 (32.8)	7.1	59.6	23.1	17.3	5.9	8.7	147.2	0.6



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 12

Type	Quadrat Frequency '95	Quadrat Frequency '00	Pellet Transect: Pellet Groups per Acre '00	Pellet Transect: Days Use per Acre (ha) '00
Rabbit	10	17	148	N/A
Elk	4	9	226	17 (43)
Deer	12	5	70	5 (13)
Cattle	2	1	148	12 (30)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 12

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	32	36	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

Artemisia tridentata vaseyana																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	18	34	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

Arctostaphylos uva-ursi																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	50	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	20		-
	'00	0		-

Cercocarpus ledifolius																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	23	34	2
	00	1	2	-	-	-	-	-	-	-	3	-	-	-	60	34	46	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	67%	00%	00%

%Change

+33%

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	40		-
	'00	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	41	50	0
	00	-	-	1	-	-	-	-	-	-	1	-	-	-	20	52	54	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	20		-

Chrysothamnus nauseosus hololeucus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	32	45	3
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160	31	41	8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	+38%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	100		-
	'00	160		-

Chrysothamnus viscidiflorus viscidiflorus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	11	16	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	20		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Mahonia repens																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	11	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pachistima myrsinites																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	88	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	88	6	-	-	-	-	-	-	-	-	6	-	-	-	200	4	3	6
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	22	2
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	5	13	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	-88%
'95	00%	00%	00%	+83%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	333	Dec:	-
	'95	40		-
	'00	240		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	40		-

Ribes cereum cereum																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	29	48	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	35	37	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

Sambucus cerulea																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	82	99	1
	00	-	-	-	-	-	-	-	1	-	1	-	-	-	20	95	106	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	+ 0%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	20		-
	'00	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	16	52	3
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	13	56	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	+ 0%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	80		-
	'00	80		-